

CLAIMS

1. A data recording method, comprising the steps of:

modulating input data for each predetermined unit;

selecting predetermined connection bits that are placed between two sequences of modulated data, each sequence corresponding to the predetermined unit, so that the absolute value of a DSV increases in only a predetermined region; and

recording the modulated data for each predetermined unit and the selected connection bits.

2. The data recording method as set forth in claim 1,

wherein the selecting step is performed by selecting connection bits from a plurality of patterns of connection bits so that the absolute value of the DSV increases.

3. The data recording method as set forth in claim 1,

wherein the selecting step is performed by selecting a predetermined code conversion table from a plurality of different code conversion tables so that the absolute value of the DSV increases and selecting connection bits in accordance with the selected code conversion table.

4. The data recording method as set forth in

claim 1,

wherein the predetermined region is an area for copy protection or security of a recording medium.

5 5. The data recording method as set forth in claim 1,

wherein when the absolute value of the DSV increases, data that is reproduced is prevented from being normally read.

10 6. The data recording method as set forth in claim 1,

wherein an error of the data causes the value of the data to vary whenever it is read.

7. The data recording method as set forth in claim 1,

15 wherein the selecting step is performed by designating an initial value for the DSV with an offset in only the predetermined region and selecting the connection bits so that the absolute value of the DSV increases.

20 8. The data recording method as set forth in claim 7,

wherein the selecting step is performed by designating an initial value for the DSV with an offset in only the predetermined region and selecting the connection bits so that the absolute value of the initial value decreases.

25 9. The data recording method as set forth in

claim 8,

wherein the offset is applied every n
predetermined units, where n is any natural number.

10. The data recording method as set forth in
5 claim 9,

wherein the offset is applied for each frame
composed of a plurality of predetermined units of
modulated data.

11. The data recording method as set forth in
10 claim 8,

wherein when a recording area is composed of
a synchronous signal area and a data area, the offset
is applied for the data area.

12. The data recording method as set forth in
15 claim 11,

wherein when the data area includes a sub
code recording area, the offset is applied for other
than the sample code recording area.

13. A data recording apparatus, comprising:

20 modulating means for modulating input data
for each predetermined unit and selecting predetermined
connection bits placed between two sequences of
modulated data, each sequence corresponding to the
predetermined unit;

25 recording means for recording the modulated
data for each predetermined unit and the predetermined
connection bits; and

controlling means for causing the modulating means to select connection bits so that the absolute value of the DSV to increase in a predetermined region.

14. The data recording apparatus as set forth in claim 13,

wherein the controlling means is configured to select connection bits from a plurality of patterns of connection bits so that the absolute value of the DSV increases.

15. The data recording apparatus as set forth in claim 13,

wherein the modulating means has a plurality of different code conversion tables, and

wherein the controlling means is configured to select a code conversion table from the plurality of different code conversion tables so that the absolute value of the DSV increases and selecting connection bits in accordance with the selected code conversion table.

16. The data recording apparatus as set forth in claim 13,

wherein the controlling means is configured to designate an initial value for the DSV with an offset in only the predetermined region and select connection bits so that the absolute value of the DSV increases.

17. The data recording apparatus as set forth in

claim 16,

wherein the controlling means is configured to designate an initial value for the DSV with an offset in only the predetermined region and select connection bits so that the absolute value of the DSV decreases.

18. A recording medium on which a plurality of predetermined units of modulated data and connection bits are recorded, the connection bits being placed between two sequences of modulated data, each sequence corresponding to the predetermined unit, the connection bits being recorded in a predetermined region so that the absolute value of a DSV increases.

19. The recording medium as set forth in claim 18, wherein the predetermined region is an area for copy protection or security.

20. The recording medium as set forth in claim 18, wherein the recording medium is composed of a synchronous signal area and a data area, and

wherein the connection bits are recorded in the data area so that the absolute value of the DSV increases.

21. The recording medium as set forth in claim 20, wherein the data area has a sub code recording area, and

wherein the connection bits are recorded in other than the sub code recording area of the data area

so that the absolute value of the DSV increases.

22. A data reproducing method, comprising the steps of:

reproducing data from a recording medium on
5 which a plurality of predetermined units of modulated
data and connection bits are recorded, the connection
bits being placed between two sequences of modulated
data, each sequence corresponding to the predetermined
unit, the connection bits being recorded in a
10 predetermined region so that the absolute value of a
DSV increases; and

detecting a reproduction state from the
reproduced data.

23. The data reproducing method as set forth in
15 claim 22, further comprising the step of:

determining whether or not the recording
medium is an original recording medium in accordance
with the reproduction state.

24. The data reproducing method as set forth in
20 claim 22, further comprising the step of:

determining whether or not data can be
reproduced in accordance with the reproduction state.

25. The data reproducing method as set forth in
claim 21, further comprising the step of:

25 detecting an error state of data in
accordance with the reproduction state.

26. The data reproducing method as set forth in

claim 21, further comprising the step of:

determining whether or not data accessed a plurality of times and obtained is the same in accordance with the reproduction state.

5 27. The data reproducing method as set forth in claim 21,

wherein the predetermined region is an area for copy protection or security, and

10 wherein the data reproducing method further comprises the step of:

causing reproducing means to access the predetermined region.

28. The data reproducing method as set forth in claim 22, further comprising the step of:

15 prohibiting data from being reproduced when the detected result at the detecting step represents that the recording medium is a copied recording medium.

29. The data reproducing method as set forth in claim 22, further comprising the step of:

20 generating an alarm that represents that data is reproduced from a copied recording medium when the detected result at the detecting step represents that the recording medium is a copied recording medium.

30. A data reproducing apparatus, comprising:

25 reproducing means for reproducing data from a recording medium on which a plurality of predetermined units of modulated data and connection bits are

recorded, the connection bits being placed between two sequences of modulated data, each sequence corresponding to the predetermined unit, the connection bits being recorded in a predetermined region so that the absolute value of a DSV increases; and

controlling means for causing the reproducing means to reproduce the predetermined region and detect a reproduction state of the reproduced data.

31. The data reproducing apparatus as set forth in claim 30,

wherein the controlling means is configured to determine whether or not the recording medium is an original recording medium in accordance with the reproduction state.

32. The data reproducing apparatus as set forth in claim 30,

wherein the controlling means is configured to determine whether or not data can be reproduced in accordance with the reproduction state.

33. The data reproducing apparatus as set forth in claim 30,

wherein the controlling means is configured to detect an error state of data in accordance with the reproduction state.

34. The data reproducing apparatus as set forth in claim 30,

wherein the controlling means is configured

to determine whether or not data accessed a plurality of times and obtained is the same in accordance with the reproduction state.

35. The data reproducing apparatus as set forth
5 in claim 30,

wherein the predetermined region is an area for copy protection or security, and

wherein the controlling means is configured to cause the reproducing means to access the
10 predetermined region.

36. The data reproducing apparatus as set forth in claim 35,

wherein the controlling means is configured to prohibit data from being reproduced when the
15 controlling means has determined that the recording medium is a copied recording medium.

37. The data reproducing apparatus as set forth in claim 36, further comprising:

alarm generating means for generating an
20 alarm,

wherein the controlling means is configured to control the alarm generating means to generate an alarm that represents that data is reproduced from a copied recording medium when the controlling means has
25 determined that the recording medium is a copied recording medium.